REMARKS

Claims 1-22 are now in the application. By this Amendment, claim 1 has been amended. Support for the amendment to claim 1 is found at least at claim 11 and at page 19, lines 33-38, of Applicant's disclosure. Claims 7-13 have previously been withdrawn by the Examiner. No new matter has been added.

Applicant appreciates the courtesies extended by Examiner Troy to Applicant's representative during the October 6, 2010 telephone interview. The following remarks constitute Applicant's separate Summary of the Substance of Interview.

Claim 22 is rejected under 35 USC 112, first paragraph, as failing to comply with the written description requirement. Specifically, the Examiner asserts that the specification does not provide support for replacing a loose granular propellant with the at least two propellant charges.

As agreed to during the October 6 interview, support for the combination of claim features of claim 22 is provided throughout Applicant's disclosure as originally filed.

Claims 1-6 and 14-21 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 694,295 to Maxim in view of U.S. Patent Application Publication No. 2005/0066835 to Hafstrand.

Independent claim 1, as amended, recites selecting a first propellant tube from among the at least two propellant tubes with a different e-dimension distance in relation to the e-dimension distance of a second propellant tube from among the at least two propellant tubes. At least this feature of the independent claim cannot reasonably be considered to be suggested in the applied citations.

Maxim suggests, at page 2, lines 27-31, that "[t]he distance between the perforations 3 in all the tubes is substantially uniform, and from this it will be understood that the larger tubes will have correspondingly a greater number of perforations." (Emphasis added). Further, a skilled artisan would interpret that in, for example, Fig. 8 of Maxim the distances between the

perforations are uniform. Accordingly, Maxim fails to suggest feature corresponding to the above-quoted features of claim 1.

Hafstrand is applied for teaching surface treatment of propellant powders. Hafstrand does not teach features corresponding to a plurality of propellant tubes, as claimed, and, in particular, not propellant tubes having different e-dimensions.

Claim 1 further recites that the maximum pressure within the barrel weapon resulting from each combustion is equal to or slightly below a maximum operational pressure of the barrel weapon.

As appreciated by the Examiner, the above-quoted feature of claim 1 is not explicitly suggested in Maxim nor explicitly taught in Hafstrand. However, the Office Action asserts that it would have been obvious to make the maximum pressure very close to the maximum operational pressure.

Applicant respectfully submits that a skilled artisan would not have arrived at the combination of all of the features of claim 1 because Maxim suggests, at page 1, line 38-45, providing a suitable burning thickness to secure the simultaneous completion of the combustion throughout the mass of the explosive. Accordingly, if anything, a skilled artisan would be motivated to modify Maxim to further optimize the pressure obtained from the simultaneous combustion of the explosive mass.

However, attempting to optimize ordinance performance does not automatically or inherently lead to the pressure profile depicted in Fig. 6 of the specification. For example, a skilled artisan may conclude that the performance of the cartridges suggested in US 694,295 to Maxim may be increased by ensuring that combustion of the plurality of cylinders occurs indeed simultaneously, as explicitly suggested in Maxim. Or, a skilled artisan, having instant Fig. 6 available, may assume that the performance is increased if the pressure created by individual cylinders increases successively, such that the last cylinder ignited causes the greatest pressure within the barrel. Conversely, the concept of partially mutually overlapping combustion is nowhere suggested in Maxim, i.e., is not recognized as a result-effective variable.

As set forth in MPEP §2144.05 II. (B), only result-effective variables can be optimized. Specifically, a particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Thus, because Maxim fails to recognize that instead of a simultaneous combustion a partially mutually overlapping combustion achieves increased performance, a skilled artisan would not have been motivated to modify the method suggested in Maxim, let alone have arrived at the specific features positively recited in the pending claims.

The Office Action states, at the bottom of page 5, that it would be seemingly impossible for the innermost tube shown in Fig. 2 of Maxim to complete combustion at the same time as the outermost tube.

Applicants note that, for illustration purposes, only about a quarter of the cross-section depicted in Fig. 2 of Maxim shows the perforations of the cylinders. However, the remaining three quarters also contain perforations. Nevertheless, even in the quarter depicted there are at least 4 perforations extending through two neighboring concentric tubes, which allows for simultaneous ignition of at least the two neighboring tubes. As noted at page 1, lines 26-27, of Maxim, the cylinders are provided with a passage between them for the ignition-flame. Also, Maxim claims longitudinal demarcations constituting a flame-passage between the cylinders and lateral vents to said demarcations. The passages for the ignition flame in Maxim are provided to allow a quick succession of ignition to achieve the stated objective of simultaneous combustion.

Further, it would at least be possible that in the three-quarters of the cross-section in Fig. 2 of Maxim, or at a different cross-section located before or after the cross-section depicted in Fig. 2, one perforation extends through the entirety of the four cylinders allowing for simultaneous ignition and, thus, completion of combustion. Thus, Applicant respectfully submits that it is not only possible that the device in Fig. 2 achieves simultaneous combustion, but that Maxim explicitly suggests, at page 2, lines 81-86, that in all of the foregoing forms the

perforations are of such dimensions and relative thickness of material that between them, so as to cause simultaneous completion of the explosive throughout the mass.

During the October 6 interview, Examiner Troy stated that the device depicted in Fig. 8 of Maxim would not allow for a simultaneous combustion because the perforations do not extend through the entirety of the explosive material. Applicant's representative noted that there is no explicit disclosure in Maxim that this device operates fundamentally differently than all of the other devices suggested in Maxim. Further, it is at least possible that a different longitudinal cross-section, for example at a 45 degree angle, would depict perforations extending throughout the mass of the explosives.

Moreover, Applicant notes that the device of Fig. 8 is discussed at page 2, lines 14-18. Subsequently, at page 2, lines 81-86, Maxim states that in all of the foregoing forms the perforations are of such dimensions and relative arrangement as to provide a uniform thickness of material between them, so as to cause simultaneous completion of the explosive throughout the mass. A skilled artisan would interpret this passage to include the device of Fig. 8 because it is one of the foregoing devices referred to at page 2, line 81.

The Office Action states, at page 5, paragraph 17, that the Examiner feels that Applicant is misinterpreting page 2, lines 81-86, of Maxim. Specifically, the Office Action asserts that throughout the mass at page 2, line 86 refers to the mass of single tube and not to the mass of the entire charge. However, Maxim suggests, at page 2, lines 41-49, that in the device of Fig. 1 outer tube 5 is not perforated to leave an unperforated layer of such thickness as to be consumed simultaneously with the complete combustion of the remainder of the charge. Thus, the simultaneous completions of combustion suggested in Maxim is not limited to a single cylinder, but describes the burn characteristic of the entire charge.

What is more, Maxim suggests, at page 1, lines 30-45, that the several cylinders are connected together and are perforated with a sufficient number of uniformly-disposed holes to proved for the lateral venting and for suitable burning thickness to secure simultaneous

combustion throughout the mass of the explosive. Applicant respectfully submits that the mass of throughout the mass of the explosive refers to the several cylinders and not just to one cylinder.

Moreover, Applicant respectfully disagrees with the assertion at the top of page 6 of the Office Action that the outermost tube must burn more slowly than the innermost tube because it has significantly more propellant and is located farther from the initial ignition point. However, as noted above, Maxim suggests, at page 2, lines 27-31, that the distance between the perforations 3 in all the tubes is substantially uniform, and from this it will be understood that the larger tubes will have correspondingly a greater number of perforations. As such, the outer tube will burn at the same rate as the inner tube because there is the same amount of material between the perforations of the outer tube compared to the amount of material between perforations of the inner tube.

Claims 2-6 and 14-22 are in condition for allowance for at least their respective dependence on an allowable claim 1, as well as for the separately patentable subject matter that each of these claims recites.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 22-0185, under Order No. 20459-00400-US1 from which the undersigned is authorized to draw.

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Respectfully submitted,

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